

REVIEW OF THE ASIAN SAWFLY GENUS *ANISOARTHRA* CAMERON
(HYMENOPTERA: TENTHREDINIDAE)

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Abstract.—*Anisoartha* Cameron includes three species, *A. coerulea* Cameron from India and Sri Lanka, *A. diascorae* (Rohwer), **n. comb.**, from India, and *A. birmanica* (Malaise), **n. comb.**, from Burma and India (new record). The species are described and illustrated, and a key is provided. *Anisoartha diascorae* feeds on yam, *Dioscorea* sp. (Dioscoreaceae).

Key Words: India, Sri Lanka, Burma, *Dioscorea*, Dioscoreaceae, Blennocampinae, *Senoclia*

Species of *Anisoartha* are relatively large, mostly metallic bluish-black or violaceous sawflies of the subfamily Blennocampinae. A characteristic, shared with several other genera of the subfamily, is the comblike, four- or five-toothed tarsal claws. The three species of the genus occur only in southern Asia—Burma, India, and Sri Lanka. Yam, *Dioscorea* sp., is a host plant for *Anisoartha diascorae* (Rohwer). A species in a related genus in the Blennocampinae, *Senoclidia purpurata* (Smith), is known to be a pest of yam in Papua New Guinea (Szent-Ivány 1974). Since yam is an important food plant in the tropics and is distributed by commerce, it is important to know and be able to recognize its potential pests.

Here we redescribe the species of *Anisoartha* and give a key for their separation.

The National Museum of Natural History, Smithsonian Institution, Washington, D.C., is designated as USNM; Zoological Department, Punjabi University, as ZDPU; and Canadian National Collection, Ottawa, as CNC.

Anisoartha Cameron

Anisoartha Cameron 1876: 461. Type species: *Anisoartha coerulea* Cameron. Designated by Rohwer 1911.

Senoclia Cameron 1877: 88 (unnecessary new name for *Anisoartha* Cameron).—Rohwer 1921: 105 (new species; key to species).—Malaise 1937: 50 (separation from *Neoclia* Malaise; new species from Burma; key to species).—Benson 1938: 367 (in *Senocliini*).—Malaise 1964: 20 (*Anisoartha* not preoccupied and is correct name for the genus).

Description.—Antenna covered with appressed hairs; scape about 2× longer than broad, pedicel as long as broad, 3rd and 4th segments subequal in length, each a little dilated at apices; 5th segment dilated at apex and little longer than 4th; 6th segment about $\frac{3}{4}$ length of 5th, dilated at apex; 7th segment shorter than 6th; apical two segments each slightly shorter than 7th (Fig. 2). Clypeus smooth, truncate or with slightly rounded anterior margin; malar space lin-

ear to less than half diameter of front ocellus; genal carina absent. Epicnemium absent. Mesoscutellum raised, conspicuous, smooth and shining. Forewing (Fig. 1) with vein M and Rs+M meeting before attaining Sc+R; vein 2A+3A furcate or curved up at its apex, furcation sometimes faint; 4 cubital cells. Hindwing (Fig. 1) with one middle cell; petiole of anal cell as long as cell. Tarsal claws comblike, with 4–5 teeth, if with 4 teeth, then acute basal lobe present (Figs. 3–5). Male penis valve with long apical filament (Fig. 12).

Remarks.—The comblike tarsal claws are characteristic of several other genera of Blennocampinae, such as *Neoclia* Malaise and *Brykella* Malaise, but *Anisoarthra* may be separated by the venation of the forewing (vein M and RS+M meeting before attaining Sc+R; vein 2A+3A curved up or furcate at its apex) and hindwing (petiole of anal cell about half as long as cell), absence of a genal carina, and absence of an epicnemium. The long apical filament of the male penis valve does not occur in other known Asian Blennocampinae and appears unique to *Anisoarthra*.

Much of the literature pertaining to this genus has been under the name *Senoclia* Cameron, an unnecessary replacement name for *Anisoarthra*. Cameron (1876) originally included two species, *A. coerulea* and *A. cyanella* from Ceylon. Though the type of *Anisoarthra cyanella* is probably lost, strong indications are that it belongs to *Senoclidea* Rohwer and that it is not from Ceylon as given in the original description (see discussion by Smith 1982). In fact, hidden in a footnote, Cameron (1877) stated "I am told by Mr. F. Smith that the locality for *Senoclia cyanella* (*l.c.* p. 462) is New Guinea, and not Ceylon." Consequently, we do not include *A. cyanella*. Rohwer (1921) added two species from India, one of which was synonymized with *A. coerulea* by Smith (1982), and gave a key to three species. Malaise (1937) added a species from Burma and gave a key to species. Malaise

did not examine types and based separation of Rohwer's species on the literature.

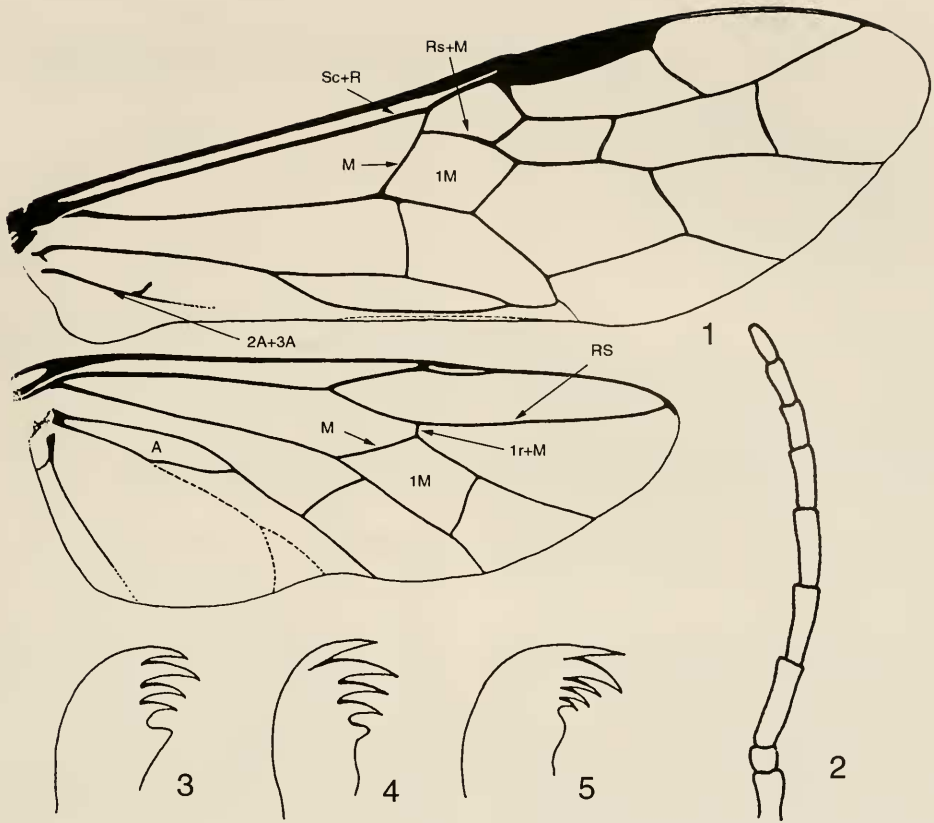
Benson (1938) placed *Anisoarthra* (mentioned as *Senoclia*) in the tribe Senocliini of the Blennocampinae. The tribe included a small group of Austro-Oriental genera (*Kampongia* Malaise, *Neoclia* Malaise, *Nesotomostethus* Rohwer, and *Anisoarthra*) separated from other Blennocampinae by the point of fusion between veins M and 1r-m of the hindwing which reaches to or very close to Rs, vein M of the forewing arising from vein Rs+M. *Nesotomostethus* is separated from *Anisoarthra* by the three-toothed tarsal claws with a basal lobe and presence of an epicnemium. *Kompongia* is separated by the two-toothed tarsal claws with a basal lobe and cell M absent in the hindwing.

KEY TO SPECIES OF *ANISOARTHRA*

1. Forewing darkly, uniformly infuscated; legs black; tarsal claws with 4 teeth and a basal lobe (Fig. 3) *A. coerulea* Cameron
- Forewing not completely infuscated, approximately basal half hyaline; bases of tibiae or most of tibiae and extreme apices of femora with a whitish or brownish spot; tarsal claws with 4 or 5 teeth (Figs. 4–5) 2
2. Tarsal claws with 4 distinct teeth and a distinct triangular basal lobe (Fig. 4); supraclypeal area flat; labrum black; lateral furrows on head parallel; postocellar area broader than long, as 4:3; about $\frac{1}{6}$ or less of bases of tibiae whitish to brownish; foretibial spur furcate at apex; male hypopygium truncate with slight notch at center *A. diascoreae* (Rohwer)
- Tarsal claws with 5 distinct teeth, basal lobe indistinct, rounded (Fig. 5); supraclypeal area triangularly roundly raised; labrum brownish to white; lateral furrows diverging posteriorly; postocellar area broader than long, as 3:2; basal $\frac{1}{2}$ or foretibia, midtibia except extreme apex, and basal $\frac{2}{3}$ hind tibia white; foretibial spur simple; male hypopygium convex, rounded *A. birmanica* (Malaise)

Anisoarthra coerulea Cameron (Figs. 3, 8)

Anisoarthra coerulea Cameron 1876: 462 (♀, ♂).—Smith 1982: 188, figs. 1, 9 13 (♀, ♂, Sri Lanka; syn.: *bilanga* Rohwer).
Senoclia coerulea: Kirby 1882: 181, pl. 8,



Figs. 1-5. 1, *Anisoarthra diascoreaea*, forewing and hindwing. 2, *A. diascoreaea*, antenna. 3-5, Tarsal claws. 3, *A. coerulea*. 4, *A. diascoreaea*. 5, *A. birminaca*.

fig. 21; Dalla Torre 1894: 186; Rohwer 1921: 105 (in key).—Malaise 1937: 52 (in key; as *caerulea*).

Senoclia bilanga Rohwer 1921: 106 (♀, ♂).

Senoclia caerulea var. *bilanga*: Malaise 1937: 52.

Female.—Length, 9.0–11.0 mm. Bluish black with metallic hue. Forewing darkly, uniformly infuscated; hindwing lightly infuscated; veins and stigma dark brown.

Antennal length shorter than abdomen, 2× head width. Clypeus with anterior margin truncate to slightly rounded; labrum broader than long, as 2:1, with deflexed and roundly pointed anterior margin; supraclypeal area triangularly raised; inner margins of eyes converging below with lower interocular distance to interocular distance at level of front ocellus to eye length as 4:5:

4; malar space linear; head in lateral view with frontal area almost on same level as eyes and supraantennal tubercles moderate, sloping backwards and confluent with low frontal ridges; median fovea prominent, ditchlike on anterior half and shallow posteriorly, reaching median ocellus; postocellar area convex, broader than long, as 3:2; temple lateral to lateral ocellus flat; post-, inter-, and circumocellar furrows distinct; lateral furrows distinct, deep, parallel and abruptly ending well before posterior margin of head; head from above narrowing behind eyes; postocellar, ocello-occipital, oculo-ocellar, and oculo-occipital distances subequal. Mesoscutellum convex, appendage not carinated or grooved; distances between cenchri to distance between tegulae as 1:5. Tarsal claws comblike with 4 dis-

tinct teeth and triangular basal lobe (Fig. 3); foretibial spur furcate at apex; hind basitarsus longer than following 3 segments combined, as 7:5; hind tibial spurs subequal in length, length of inner tibial spur to apical width of hind tibia to outer apical tibial spur length as 3:2:2. Lancet similar to Fig. 6, with 22 serrulae. Sheath short, in lateral view with dorsal margin bent down apically (Fig. 8).

Head with sparse, minute, irregular punctures, surface shining; mesonotum and mesepisternum with minute, scattered punctures, surface shining with general oily luster; mesoscutellum and appendage impunctate, surface polished; abdomen impunctate, surface subshining. Body covered with mixed metallic blue and silvery pubescence.

Male.—Length, 9.0–10.0 mm. Similar to female. Hypopygium truncate with slight notch at center. Genitalia similar to Figs. 11, 12.

Types.—The lectotype ♀ of *A. coerulea*, designated by Smith 1982, is in The Natural History Museum, London, labeled "Type, H.T."; "B.M. Type Hym. 1.363"; "B.M. Type, Hym. *Anisoarthra coerulea* (Cameron, 1876)"; "Ceylon"; "Kby. p. 8. f. 21."

The holotype of *Senoclia bilanga*, a ♀, is in the USNM, labeled "Kollegal, 2,000 feet (about 606 meters), Coimbatore, S. India, 1-IX-17, Ramakrishna."

Specimens examined.—INDIA: Tamil Nadu, Kollegal (Coimbatore), 600 m, 25.9.1917; Kollegal, 2,000 ft., 1-IX-17, Ramakrishna, coll. (♂ allotype of *S. bilanga*, USNM); Nilgiri Hills, Kallar, 1,250 ft., South India, Oct. 1955, P.S. Nathan. SRI LANKA: North Central Province; North Western Province; Central Province (see Smith 1982 for records).

Distribution.—India (Tamil Nadu); Sri Lanka.

Host.—Unknown.

Remarks.—The uniformly infuscated wings, entirely bluish black legs, short antennal length (2 times the head width), and 4-toothed tarsal claws with a basal lobe will

separate this species from both other species of *Anisoarthra*. The female lancet and male genitalia are very similar to those illustrated for *S. diascorae* (Figs. 6, 11–12).

Rohwer (1921) distinguished *bilanga* because of differences he observed in the male. The females he had were identical to *A. coerulea*. The characters he used were the uniformly infuscated wings and the head more distinctly punctured and with stronger antennal furrows. We do not see these differences in the males examined.

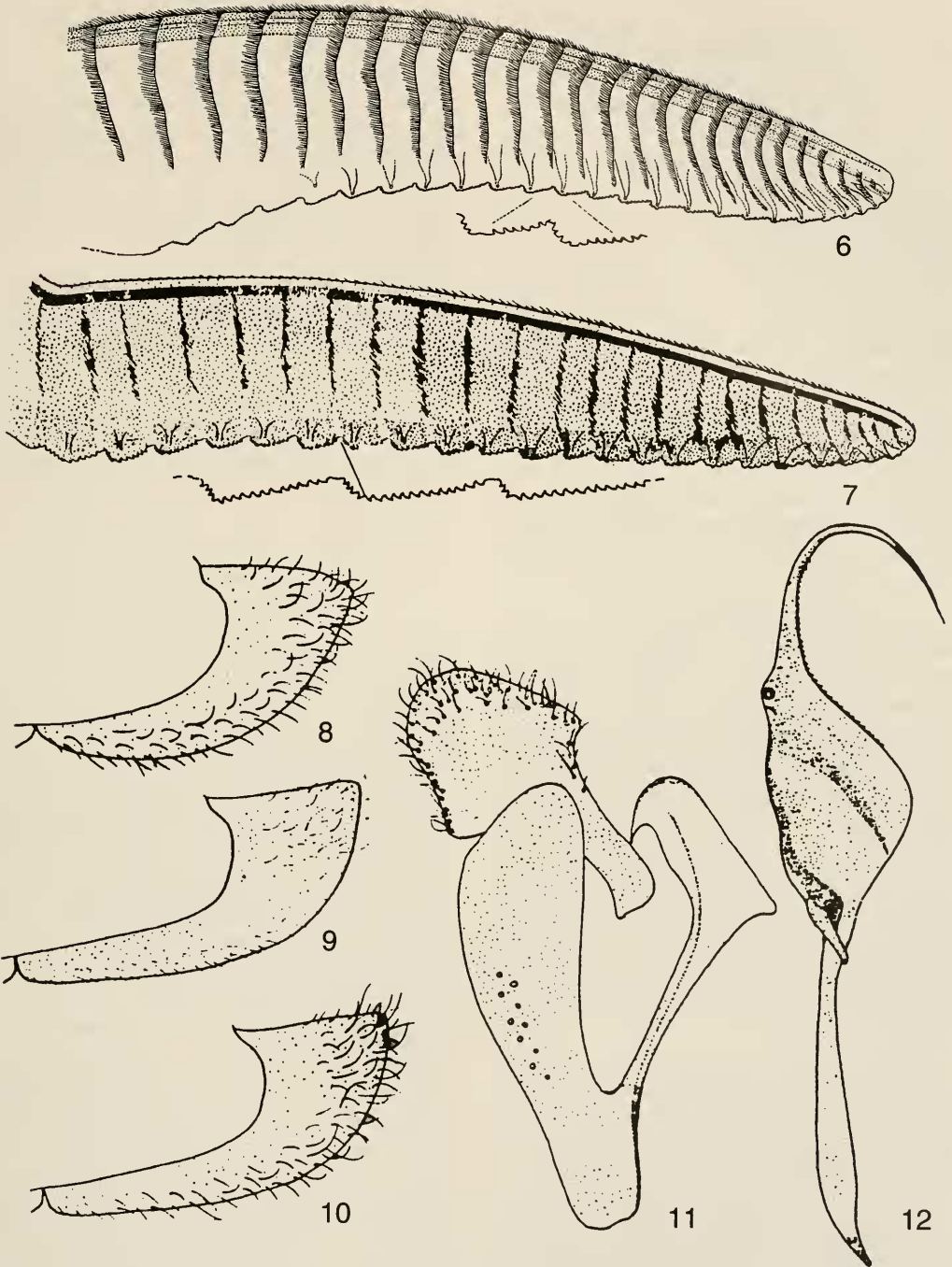
Anisoarthra diascorae (Rohwer), **new combination**

(Figs. 1, 2, 4, 6, 9, 11–12)

Senoclia diascorae Rohwer 1921: 105 (f, m).—Malaise 1937: 51 (in key).

Female.—Length, 10.0–11.5 mm. Bluish black with metallic hue; basal $\frac{1}{6}$ or less of tibiae and small spot on apices of femora brownish to whitish. Wings darkly infuscated beyond proximal end of cell 1M in forewing and hindwing; rest of wings hyaline; veins and stigma dark brown to black.

Antennal length equal to abdomen length, subincrassinate in middle, 2.4× head width; clypeus truncate; labrum broader than long, as 2:1, with deflexed roundly pointed anterior margin; supraclypeal area almost flat; inner margins of eyes converging below, lower interocular distance to interocular distance at front ocellus to eye length as 7:9:8; malar space about half diameter of front ocellus; head in lateral view with frontal area though prominently raised still slightly below level of eyes and supraantennal tubercles slightly indicated and confluent with roundly raised frontal ridges; median fovea prominent, ditchlike on anterior half and shallow posteriorly, reaching median ocellus; postocellar area convex, broader than long, as 4:3; temples lateral to lateral ocelli depressed, post-, inter-, and circumocellar furrows distinct; lateral furrows distinct, deep, parallel and abruptly ending well before posterior margin of head; head from above parallel behind eyes;



Figs. 6-12. 6, Lancet of *Anisoarthra diascoreae*. 7, Lancet of *A. birmanica*. 8, Female sawsheath of *A. coerulea*. 9, Female sawsheath of *A. diascoreae*. 10, Female sawsheath of *A. birmanica*. 11, Ventral view of genital capsule of *A. diascoreae*. 12, Lateral view of penis valve of *A. diascoreae*.

postocellar, ocello-occipital, oculo-ocellar, and oculo-occipital distances as 4:7:7:5. Mesoscutellum subconvex with faintly indicated lateral carina; mesoscutellar appendage neither carinated or grooved; distance between cenchri to distance between tegulae as 2:9. Tarsal claws with 4 distinct teeth and triangular basal lobe (Fig. 4); foretibial spur furcate at apex; hind basitarsus longer than 3 following segments combined, as 5:4; length of inner tibial spur to apical width of hind tibia to outer apical tibial spur length as 5:3:4. Lancet as in Fig. 6, with 22 serrulae. Sheath in lateral view long with dorsal margin slightly curved upward (Fig. 9).

Head with shallow and scattered punctures, surface shining, mesonotum with minute, scattered punctures, surface shining; mesoscutellum with conspicuous punctures on posterior slope, surface polished; mesoscutellar appendage impunctate, polished; mesepisternum and mesosternum punctured like mesonotum, surface shining with general oily luster; abdomen shining with some scattered and minute punctures. Body covered with mixed metallic blue and silvery pubescence.

Male.—Length, 9.0–10.0 mm. Similar to female except antennal segments 7–9 and extreme apices of femora brownish. Malar space linear; postocellar area broader than long, as 3:2. Hypopygium truncate, with shallow notch at center. Genitalia as in Figs. 11–12.

Types.—The holotype ♀ is in the USNM, labeled “N. Malabar, Taliparamba, India”; “on pepper vine June ‘18.” Allotype and paratypes in USNM; paratypes in the Zoological Survey of India, Calcutta.

Specimens examined.—INDIA: Kerala, Poonnudi Range (Trivandrum), 3,000 ft., May 1972; South Canara Dt., Kollar Ghat, 3000 ft., 18-21-IX-18, T.V.R. (1 ♀ paratype, USNM); N. Malabar, Taliparamba, July–Aug. 1918, P.S. Nathan (♂ allotype, USNM), same data, 16-26-IX-18, Ramakrishna, coll. (1 ♂ paratype, USNM); Ammatti, Coorg, S. India, May 1951, P.S. Na-

than; Nilgiri Hills, S. India, 3,500 ft., May 1950, P.S. Nathan.

Distribution.—India (Kerala).

Host.—Rohwer (1921) stated adults were bred “on a creeper, *Dioscorea*,” probably a misspelling for *Dioscorea* sp. (Dioscoreaceae). An adult was collected “on pepper vine” (? black pepper, *Piper nigrum* L. [Piperaceae]).

Remarks.—The tarsal claws with 4 teeth and a distinct triangular basal lobe, whitish to brownish bases of tibiae and extreme apices of femora, hyaline basal half of forewing, furcate foretibial spur, postocellar area broader than long, and antennal length 2.4 times head width, will separate this species from other species of *Anisoarthra*.

Anisoarthra birmanica (Malaise), **new combination**
(Figs. 5, 7, 10)

Senoclia birmanica Malaise 1937: 51 (f).

Female.—Length, 12.0–13.0 mm. Bluish-black with metallic hue antenna, labrum, extreme apex of forefemur, basal half of foretibia, midtibia except extreme apex, and basal $\frac{2}{5}$ of hind tibia whitish to light brownish. Forewing and hindwing deeply infuscated beyond proximal end of cell 1 M and infuscation linearly extending to base of wings covering entire anal cell; veins and stigma dark brown to black.

Antennal length equal to abdomen length; subincrassinate in middle, 3.2× head width. Clypeus truncate; labrum broader than long as 2:1 deflexed and roundly pointed anteriorly; supraclypeal area subtriangularly roundly raised; inner margins of eyes converging below, lower interocular distance to interocular distance at level of front ocellus to eye length as 3:4:3; malar space linear; head in lateral view with frontal area almost at level of eyes and supraantennal tubercles significant with steep posterior slope and meeting low lying frontal ridges; median fovea prominent on anterior half and shallow posteriorly, reaching median ocellus; frontal area anterior to

median ocellus conspicuously depressed, thus forming humplike raised projection between depression and median fovea; postocellar area convex, broader than long, as 3:2; temples lateral to lateral ocelli subconvex; post-, inter-, and circumocellar furrows distinct; lateral furrows quite distinct, deep, diverging backwards and abruptly ending well before hind margin of head; head from above parallel behind eyes; postocellar, ocello-occipital, oculo-ocellar, and oculo-occipital distances as 4:4:5:4. Mesoscutellum subconvex, its appendage neither carinated nor grooved; distance between cenchri to distance between tegulae as 1:5; tarsal claws comblike with 5 teeth and indistinct rounded basal lobe (Fig. 5); foretibial spur simple, hind basitarsus longer than following 3 segments combined, as 5:4; length of inner tibial spur to apical width of hindtibia to outer apical tibial spur length as 5:3:4. Lancet as in Fig. 7, with 21 serrulae; sheath in lateral view long with dorsal margin slightly curved up apically (Fig. 10).

Head with dense, irregularly spaced, prominent punctures and surface between punctures microsculptured, surface shining; mesonotum with dense, irregular, minute punctures, surface shining; mesoscutellum with distinct, irregular, scattered punctures, more conspicuous on its posterior slope, surface polished; mesoscutellar appendage impunctate, polished; mesepisternum and mesosternum with few, scattered micro-punctures, surface shining with general oily luster; abdomen impunctate, shining. Body covered with mixed blackish and metallic blue pubescence.

Male.—Length, 10.0–11.0 mm. Similar to female. Hypopygium truncate at apex. Genitalia similar to Figs. 11–12.

Types.—Described from 2 ♀, deposited in the Naturhistoriska Riksmuseet, Stockholm, Sweden. From Burma (Taungdo at the south end of Inle Lake in southern Shan States, alt. 900 m, 19.IX.1934) (Malaise 1937).

Specimens examined.—INDIA: Assam,

Shillong, 1,450 m, 7.6.1943 (ZDPU; Assam, Kameng, Bokhar, 28-V-61, 2,500' (CNC).

Distribution.—Burma; India (Meghalaya).

Host.—Unknown.

Remarks.—The mostly whitish to brownish tibiae, whitish extreme apices of the femora, hyaline basal half of forewing and hindwing, triangularly raised supraclipeal area, 5-toothed tarsal claws with and indistinct rounded basal lobe, white labrum, and simple foretibial spurs will separate this species from other species of *Anisoarthra*. We did not examine the types. Malaise's (1937) description is sufficient to characterize this species. A series of three females and three males from Kameng, Assam associate the sexes.

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